(12) UK Patent Application (19) GB (11) 2 319 756 (13) A

(43) Date of A Publication 03.06.1998

(21) Application No 9624761.4

(22) Date of Filing 28.11.1996

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(51) INT CL[6]
B62D 57/00 , A63G 29/00

(52) UK CL (Edition P)
B7H HMZ

(56) Documents Cited
GB 0360137 A US 4386787 A

(58) Field of Search
UK CL (Edition O) B7H HMZ HNF HNJ
INT CL[6] A63G 29/00 29/02 , B62D 57/00 57/02 63/00 63/02
Online: WPI

(54) Spherical vehicle

(57) A vehicle comprises a sphere propelled by a carriage E having driving wheels C frictionally engaging the interior of the sphere. The carriage has a weight D to define its centre of gravity and a supporting mechanism H with guiding wheels G. The driving wheels may be replaced by endless tracks or belts (Fig. 5). The sphere can be remotely controlled and used for remote inspection or can be used as a toy or recreational vehicle, in games. The sphere can itself be within a non-spherical body and used to propel that (Figs 8, 9).

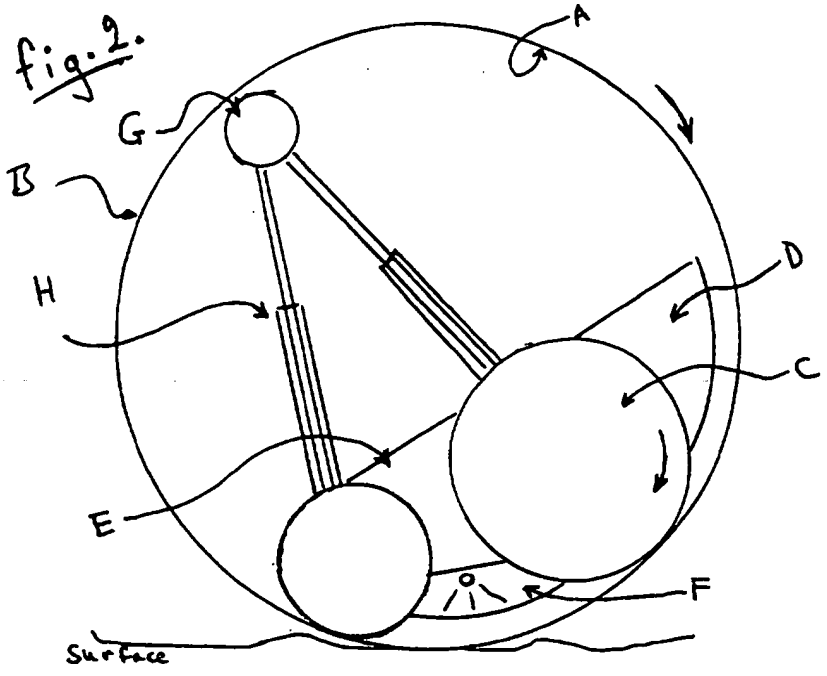

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fig. 1.

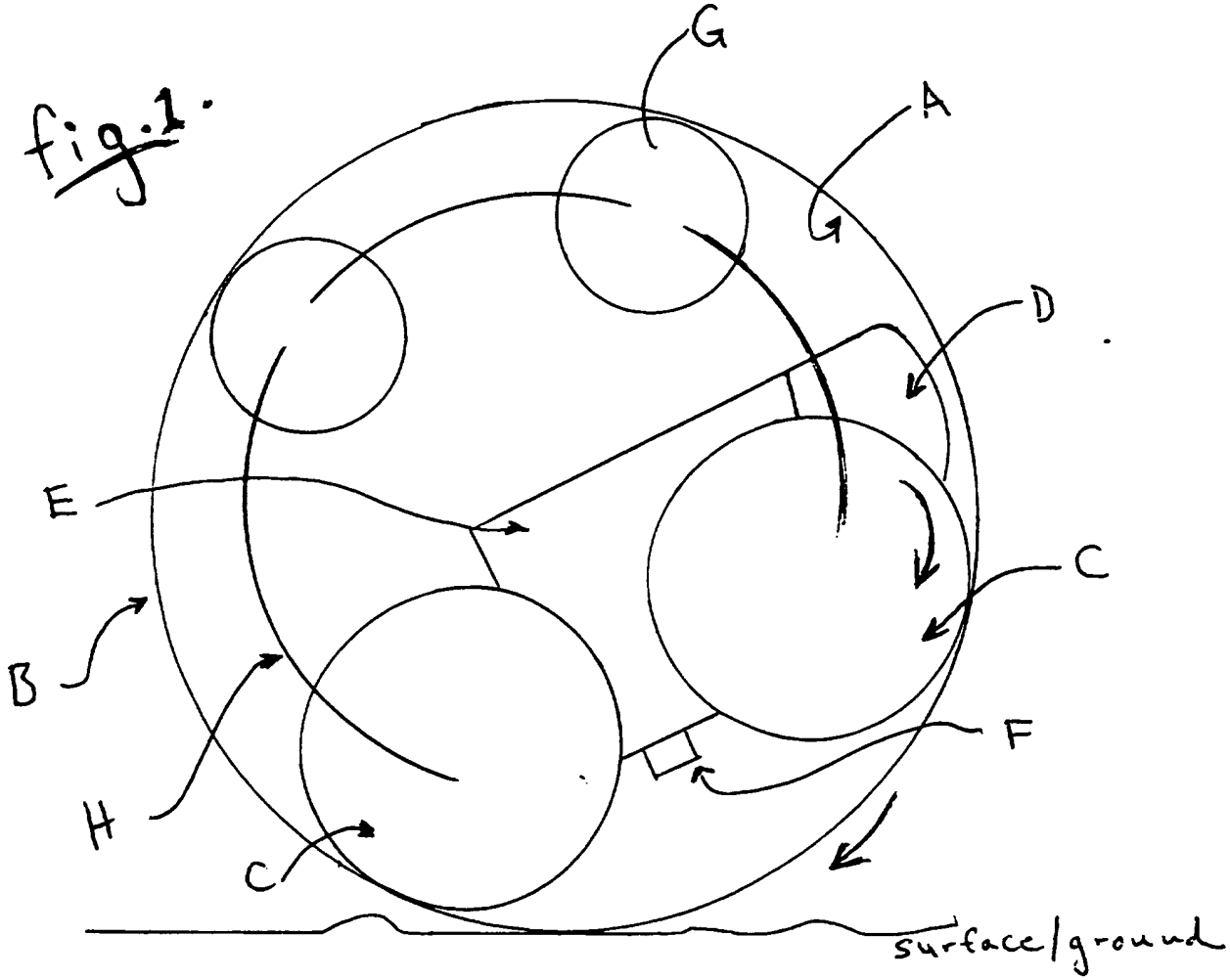


fig. 2.

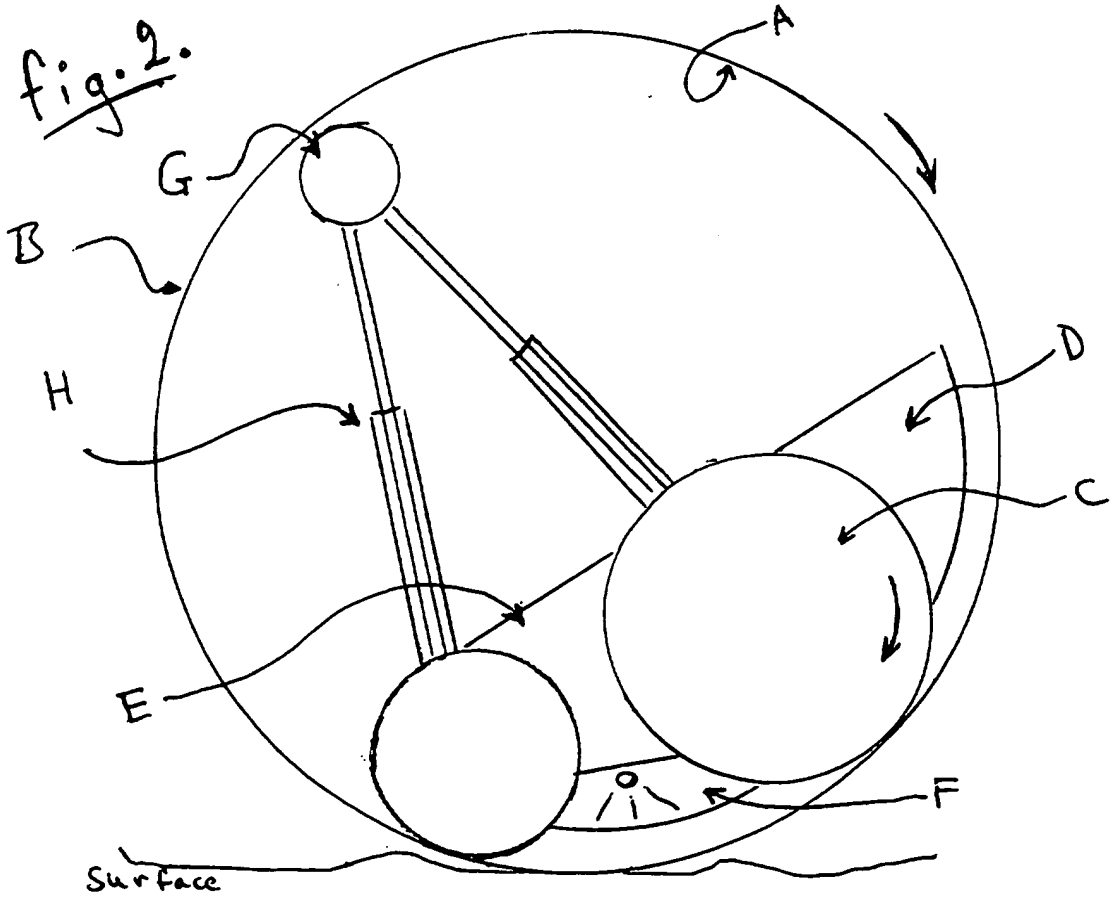


fig 3.

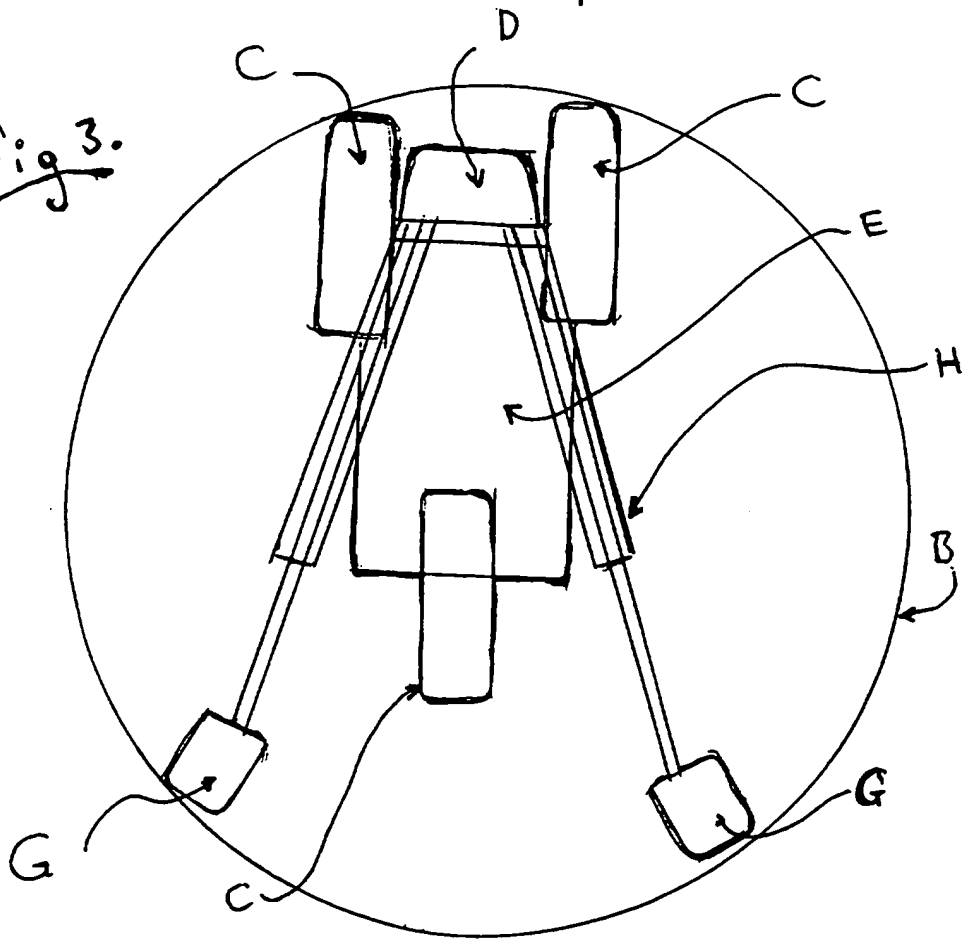


fig 4.

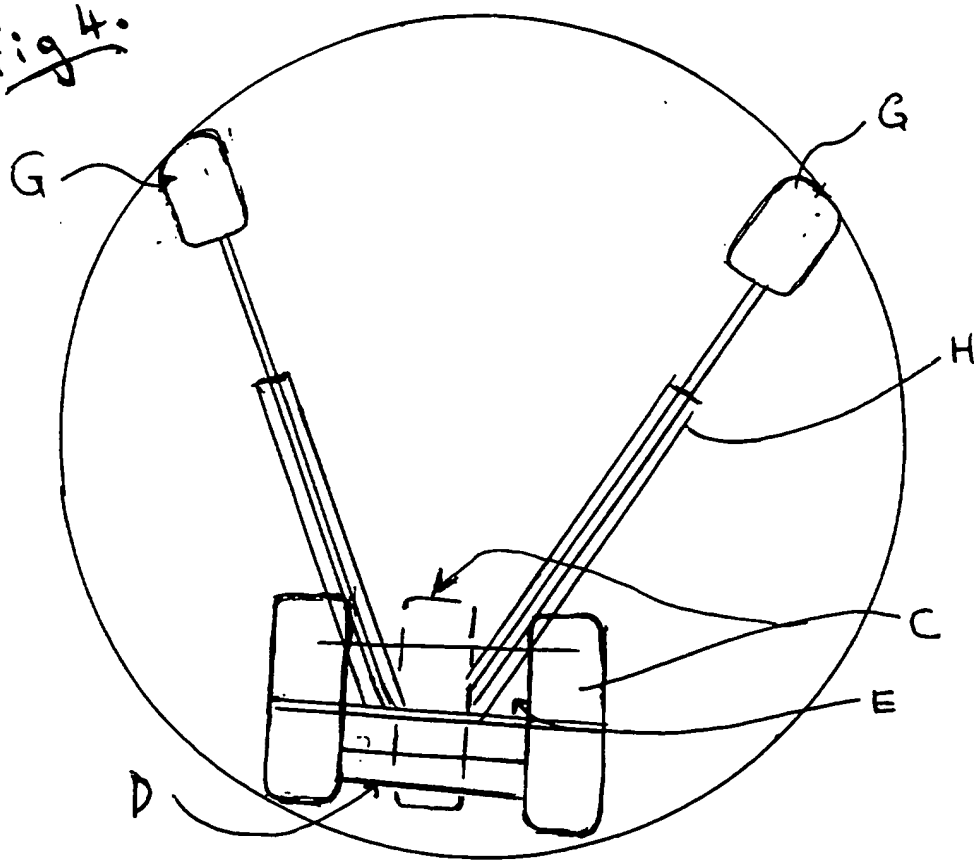


fig 5.

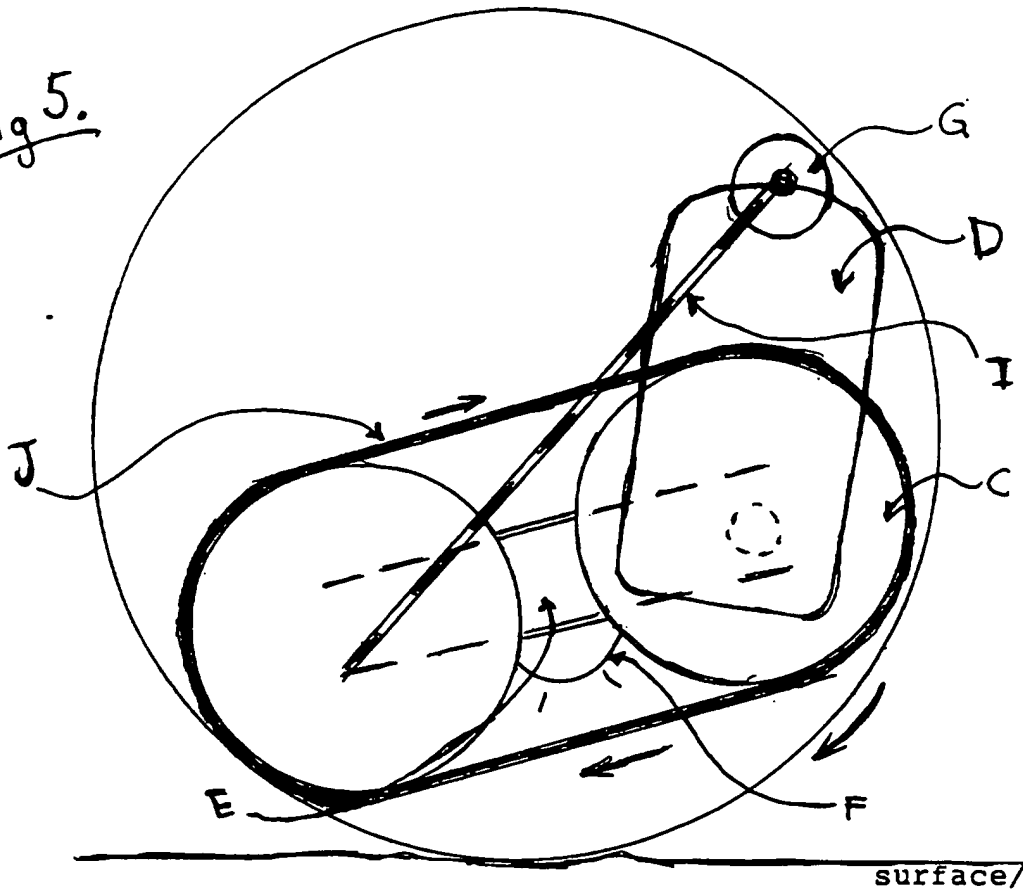


fig 6.

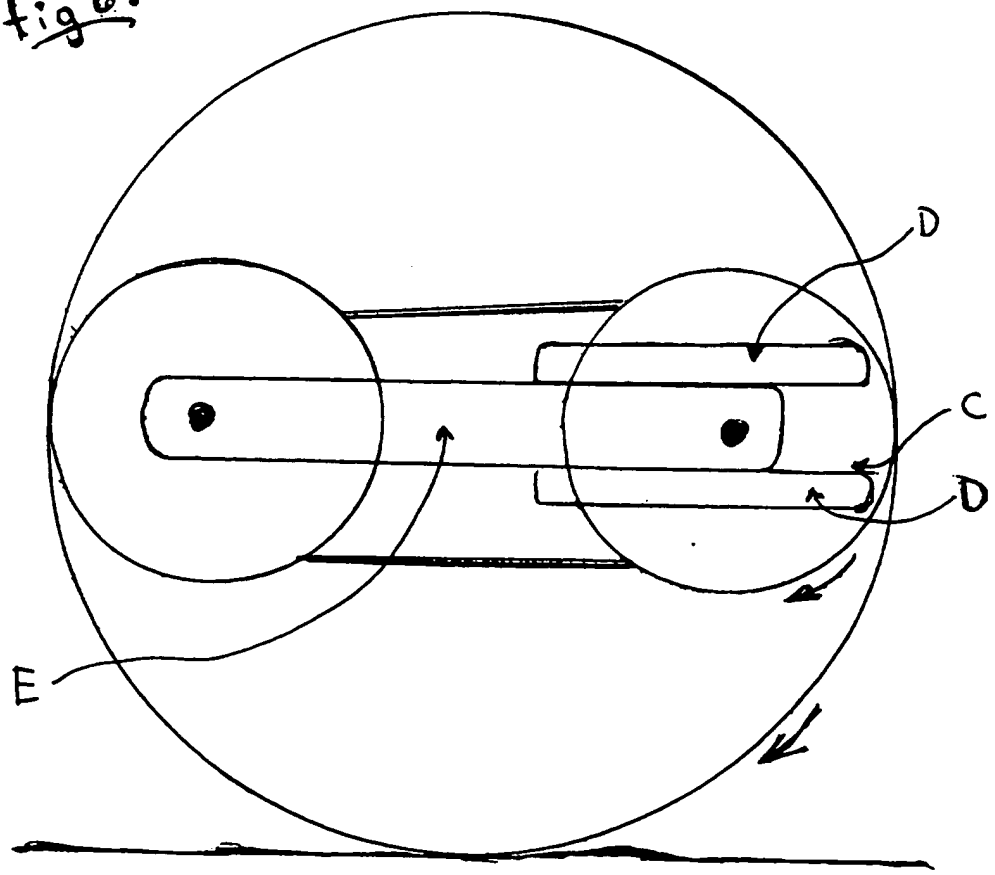


fig. 7.

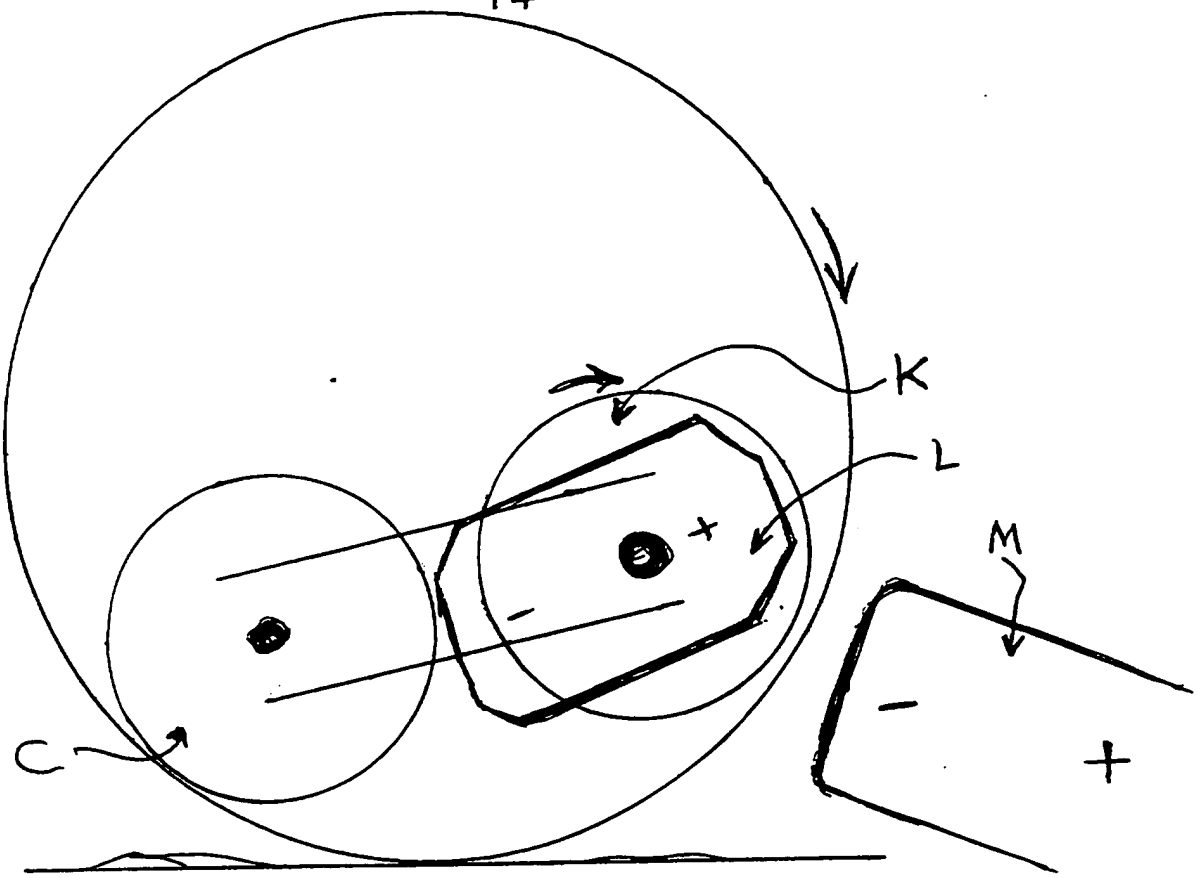


fig. 8.

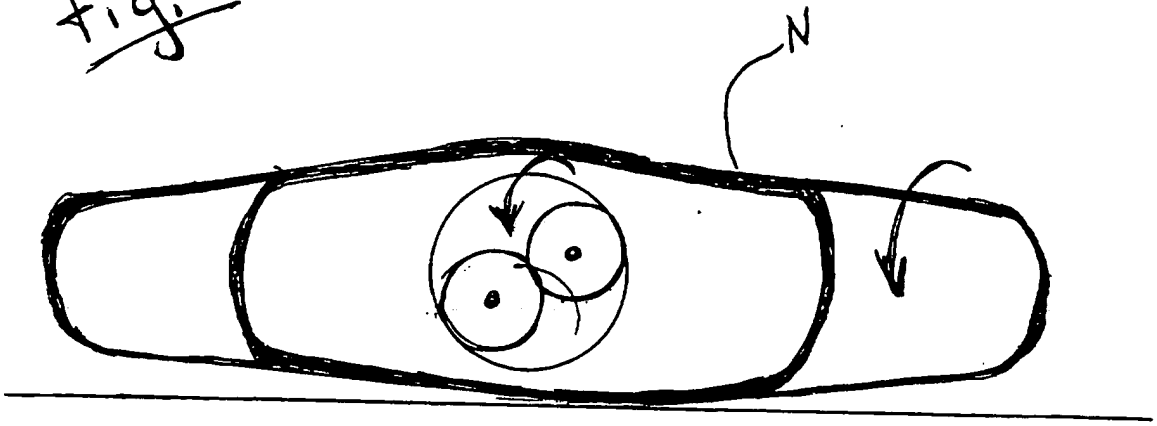
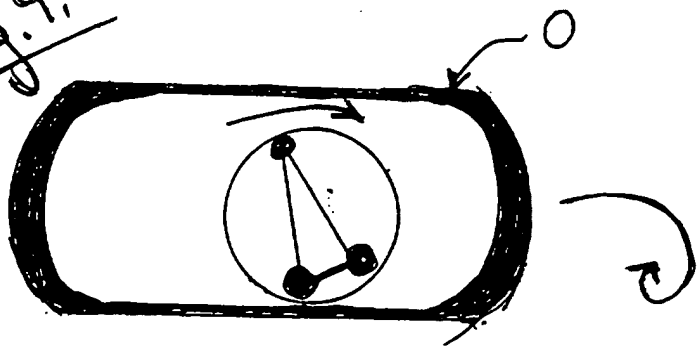


fig. 9.



ROLLING SPHERE

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This invention relates to spherical vehicles.

Existing spherical vehicles are propelled by a weight revolving around a fixed central axis or axel traversing the centre of the sphere. Other spherical systems employ complicated gyro systems or so called reaction thrust engines to create a forward motion.

Axels transversing spheres limit free movement within the spheres internal 360 radius and circumference, and thus prevent safe and practical transport of articles or instruments within the sphere. Since most propelling devices rotate in a circular motion around a central axis, they do not allow measuring/detection instruments to maintain a horizonal position during transportation.

This invention is driven by an internal mechanism and does not have a central axel traversing the sphere, so by eliminating obstacles along the course of the spheres internal walls, thus providing free internal range of movement within 360 degrees. The system is relatively simple but efficient and inexpensive to manufacture. Since the internal driving mechanism does not pivot around a centrally placed axel it provides the possibility to transport articles or instruments in a horizontal position.

Movement of the sphere is provided by at least one wheels rotational friction action, acting on the interior surface of the spheres walls, and/or by the simultaneous shift of weight altering the spheres centre of gravity.

The internal propulsion system consists of an operational vehicle or carriage which wheels are supported by the spheres internal walls. The carriage or operational vehicle bears e.g. engine, power supply, computer, transmitter, sensors, instruments, radar, receiver, sonar, Geiger counter, metal detector and other necessary equipment. The driving wheel/wheels frictional rotational traction action ascends along the inner surface, as well as changing the centre of gravity of the sphere, causes the sphere to rotate in the same direction. Adjustable supports prevent the carriage from tilting or toppling over, and to allow the carriage to loop around the spheres inner walls. The carriage can also be centered in the sphere so that the wheels act as supports like in fig. 6. The additional supporting wheels may themselves be active and operational in the propulsion of the sphere.

The spheres external periphery surface may be made of suitable material to roll over various mediums such as grass, gravel, sand, asphalt, ice, snow, water or under water etc.
Since the sphere rolls forward due to internal centre of gravity change and internal friction, there will arise a minimum amount of external rotational friction or traction on the supporting surface.
Instruments such as Geiger counters for detecting radio activity in an area or metal detectors for searching for mines or other metal objects are well protected from corrosion, dust, dampness and other external destructive forces.
The carriage may be remotely controlled, internal computer controlled, magnetically controlled or other suitable means. The weight which alters the spheres centre of gravity may be a special weight positioned in a suitable position, or the engine, battery or instrument may act as a weight. The wheels bearing the carriage may be steerable single or multi-wheel driven, and/or caterpiller treads may be employed or other suitable wheel types.
The sphere can also be enjoyed as a toy e.g. two or more spheres may compete in events like racing, touch & go games, bump & tackle games, the spheres may move other objects such as a football etc.
The energy supply may be supplied by batteries, ultrasound, magnetical, laser, solar, microwave or other suitable energy form.
The operational vehicle can also be modified to perform the same propelling action even after having been inverted i.e. the carriage or operational vehicle has no specific up or down side.
The weight which is responsible for changing the spheres centre of gravity may be attached directly or indirectly to the carriage or operational propelling vehicle and may be adjustable and movable even when the carriage is stationary., thus, enabling the centre of gravity to alter and enhance the spheres movement independantly of the wheels frictional action.
The spheres shell will also shield the carriage or operational vehicle, and may be kept sanitary. Grime and radioactive dust particles can be more easily removed from round surfaces than irregular surfaces with plenty of crevices.

A specific embodiment of the invention will now be described by way of example with reference to the accompanying drawing in which:- B=exterior surface

Figure 1 shows a side view of the carriage or operational vehicle E where wheels C and weight D act on the interior surface of the spheres wall A. The supporting mechanism H with supporting wheels G, are also seen as well as a detection instrument F.

Figure 2 shows a side view of a modified propulsion system with adjustable stabilizing supports H.

Figure 3 shows a top view of one example of possible constructions of an operational propelling carriage.

Figure. 4 illustrates an example of an operational vehicle seen from either in front or from behind.

Figure 5 shows a modified propelling carriage using roller belts or caterpillars E, as well as a pivot mechamism I for regulating a movable weight D.

Figure 6. shows both a centrally positioned carriage, and gives an example of a uniform carriage which propelling properties are equally effective in the inverted position.

Figure 7. shows another modified form of the propulsion mechanism. Here wheel C has been replaced by a magnetic wheel K or weight D has been replaced by magnet L, and is propelled by an external magnet M.

Figure 8. shows the sphere operating the movement of differently shaped objects e.g a rugby ball or similar object.

Figure 9 shows a jumping bean in action.

CLAIMS

1. A spherical vehicle comprising a hollow body in the form of a sphere, propelled by an internal operational vehicle's or carriage's rotating wheel or wheels acting on the interior surface of the walls of the sphere by means of frictional/ traction force, and a simultaneous shift of the weight borne by the carriage, causing a change in the centre of gravity and thereby resulting in a rolling motion in the direction of these two major forces.

2. A spherical vehicle as claimed in Claim 1, wherein adjustable stabilizing supports as shown in fig 1&2 protrude from the carriage or operational vehicle, of which their supporting wheels may themselves be active and operational.

3. A spherical vehicle as claimed in Claim 1 and Claim 2, wherein the operational vehicles' or carriages' wheels are single or multi-driven and/or steered or caterpillars, i.e roller belts, and others.

4. A spherical vehicle as claimed in any preceding claim, wherein the carriage or operational vehicle is remotely controlled, computer controlled, magnetically controlled, sensory controlled or other suitable means.

5. A spherical vehicle as claimed in any preceding claim, wherein a special adjustable weight attached directly or indirectly to the carriage or operational vehicle alters the spheres centre of gravity.

6. A spherical vehicle as claimed in any preceding claim, wherein the carriages' or operational vehicles' own wheels are centered in the sphere such that they stabilize and support as illustrated in fig. 6

7. A spherical vehicle as claimed in any preceding claim, wherein the sphere operates the movement of other shaped objects e.g. cylindrical objects, rugby-shaped objects, irregular-shaped objects etc.

8. A spherical vehicle substantially as described herein with reference to Figures 1-6 of the accompanying drawings.

9. A spherical vehicle as claimed in any preceding claim, wherein the operational vehicle or carriage will exert a 360 degree propelling action also in the inverted position.

Application No: GB 9624761.4 **Examiner:** T S Sutherland
Claims searched: 1 **Date of search:** 7 February 1997

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.O): B7H (HNF, HNJ, HMZ)

Int Cl (Ed.6): B62D 57/00, 57/02, 63/00, 63/02; A63G 29/00, 29/02.

Other: Online: WPI

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
X	GB 0360137	(PURVES) See page 6 lines 38 to 47, page 6 line 116 to page 7 line 1 and the Figs	1
X	US 4386787	(MAPLETHORPE) See Figs 4, 5, 10 and 11.	1

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.